

Pennsylvania Game Commission

Wildlife Careers



Summary: Students explore two different Wildlife careers within the Pennsylvania Game Commission. As a result, students learn about the scientific method, practice a biologist-related math problem, how to search for wildlife careers, and learn to fill out a (mock Wildlife Biologist) job application.

Subject Area: 13

Standard Area: 13.1 Career Awareness and Preparation

Organizing Category: 13.1.8.

Grade Levels: 5-8

Standards: 13.1.8.A Relate careers to individual interests, abilities, and aptitudes.; 13.1.8.B Relate careers to personal interests, abilities and aptitudes.; Explain the relationship of career training programs to employment opportunities.; 13.1.5.E Describe the factors that influence career choices, such as, but not limited to: Geographic location, job description salary, benefits, work schedule, working conditions, 13.1.8.F Analyze the relationship of school subjects, extracurricular activities, and community experiences to career preparation.

Other Related Standards: 4.3.7.C

Duration: 2-3 class periods

Objectives:

- Students will analyze wildlife career options within the Game Commission based on a variety of criteria including earnings, education/training, and job requirements by watching short videos, researching a wildlife biologist job, and filling out a mock wildlife biologist job application.
- Students will identify skills required for a career in wildlife by solving a practical math question, analyzing the real-life use of the scientific method, and researching a wildlife biologist job posting.

Materials:

- Wildlife Careers Lesson Plan-PowerPoint
- Computer with access to the internet, screen, and projector
- Student computers or iPads
- Pencils
- The Following Worksheets (printed from the PowerPoint): Slides 19-22 Note: some of the worksheets are design to be cut in half or in thirds

Background: The Pennsylvania Game Commission formed in 1895 during a time period when wildlife was dwindling as a result of unregulated hunting and habitat destruction. The Game Commission was established to protect the remaining wildlife and replenish some of the species that were extirpated or had very low numbers. The mission of the Pennsylvania Game Commission is to manage Pennsylvania's wild birds, wild mammals, and their habitats for current and future generations. The Commission accomplishes their mission through wildlife protection, monitoring wildlife populations, establishing laws and regulations, setting seasons and bag limits, establishing and maintaining habitat, and informing and educating the public. The Game Commission is mostly funded by hunters and trappers and does not receive state General fund appropriations. The Pennsylvania Game Commission owns and manages over 1.5 million acres of land called State Game Lands (SGL). These lands are purchased primarily to ensure wildlife has access to suitable habitat and the public has access to hunting and trapping areas. These lands are also used by secondary users for hiking, wildlife watching, and other recreational activities.

Pennsylvania Game Commission

Wildlife Careers



Procedure:

- **Prior to presenting this lesson plan:**
 - Make sure that all equipment (computer, projector, screen, and speakers) is working.
 - Review all content including the three short videos to assure they are appropriate to show to your class.
 - Print student worksheets out located on slides 19-22
 - Print script out for this lesson plan located on slides 25-28
- **Follow the script to teach this lesson**

Extensions:

- **Students can research the civil service website for other wildlife careers that they are interested in and present a presentation to the class on the skills and educational requirements for that job.**
- **Students can interview a wildlife biologist and present a report to the class.**

References:

1. Project Wild K-12 Curriculum & Activity Guide
2. Sadava, D.; Heller, C. H.; Orians, G.H., Purves, W.K., Hillis, D. M. (2007) Life: The Science of Biology. Sunderland, MA: Sinauer Associates.
3. "February Bear Den Visit." You Tube/February Bear Den Visit, Pennsylvania Game Commission, 23 Mar. 2015, www.youtube.com/watch?v=EA5A2ZHEIVE.
4. "The Scientific Method." Khan Academy, 2017, www.khanacademy.org/science/biology/intro-to-biology/science-of-biology/a/the-science-of-biology.
5. "Ruffed Grouse-Short Version." Pennsylvania Game Commission, 24 Jan. 2017, www.youtube.com/watch?v=oE_KnTAt7AY&t=3s
6. Pennsylvania Game Commission, *PGC Updates!* Newsletter 9/2017, <http://www.pgc.pa.gov/InformationResources/MediaReportsSurveys/Documents/PGC%20Updates%20Newsletter%20201709.pdf>
7. Pennsylvania Game Commission, *Careers and Volunteer Opportunities, Becoming a Wildlife Conservation Officer*, 2017, <http://www.pgc.pa.gov/InformationResources/CareersandVolunteers/Documents/Becoming%20a%20Wildlife%20Conservation%20Officer.pdf>
8. Clipart from www.clipart.org



Photo courtesy of: Mandy Marconi



Photo courtesy of: Nathan Boop



Choosing a Career Path

YOUR CAREER

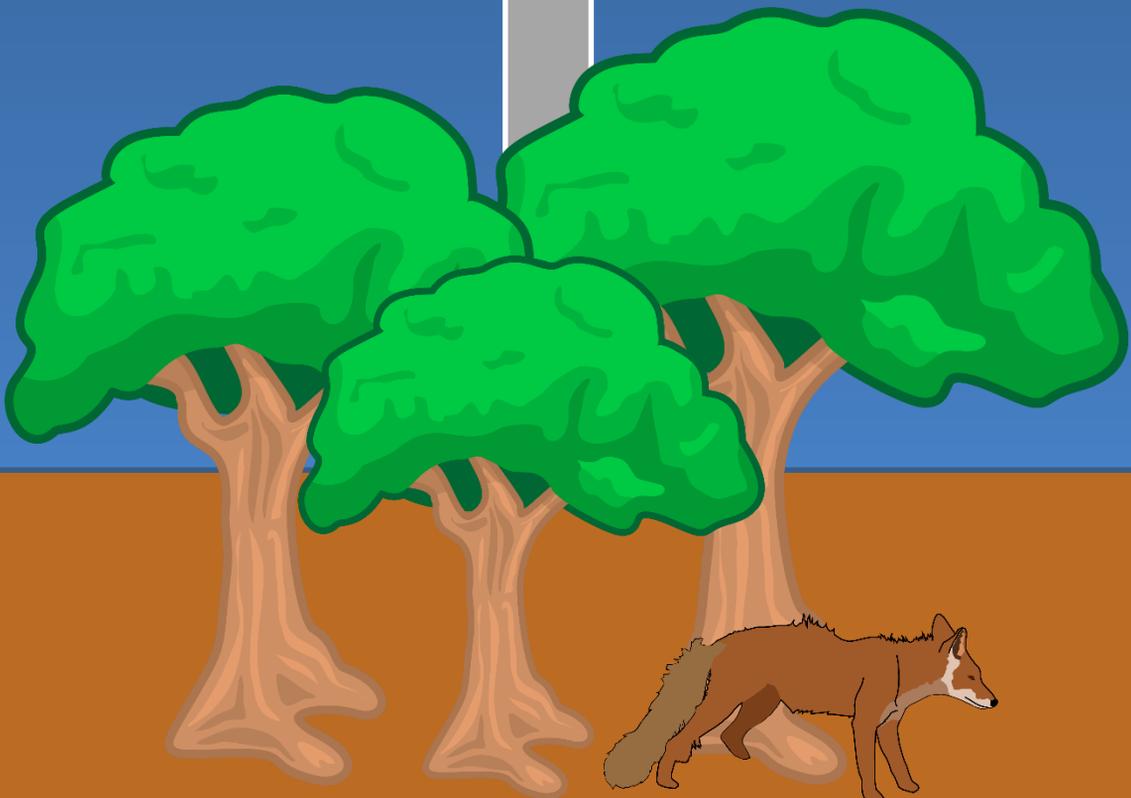




Choosing a Wildlife Career Path



YOUR CAREER





Choosing a Wildlife Career Path



Photo courtesy of: Nathan Boob



Choosing a Wildlife Career Path

connecting
 *you*
with Wildlife

<https://www.youtube.com/watch?v=EA5A2ZHEIVE>



Think Like a Scientist

Make an Observation

Ask a Question

Propose a Hypothesis

Make a Prediction

Test the Prediction

Conclusion

Next Step



Think Like a Scientist



Photo courtesy of: Hal Korber

https://www.youtube.com/watch?v=oE_KnTAt7AY



Practice Being a Biologist

Question:

If 60 pounds of a black bear's diet is plants, acorns, and berries and 20 pounds of its diet is insects and other animals, what percentage of the whole diet is a vegetarian diet?





Practice Being a Biologist

Answer:

75% of the black bear's diet is vegetarian.

(Typically, a Pennsylvania black bear's diet is greater than 75% Vegetarian)

Steps:

· Pounds of Vegetarian Diet / Pounds of Whole Diet * 100

· $60/80 * 100$

· $.75 * 100 = 75\%$



Elk Biologist?



Photo courtesy of Mandy Marconi



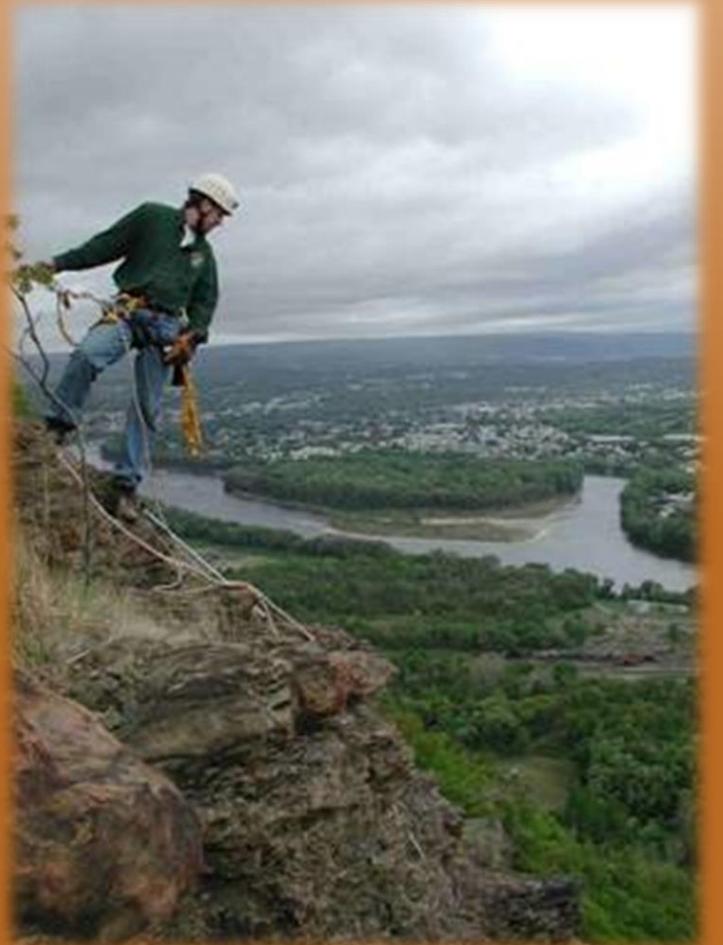
Photo courtesy of: Marconi

Public Speaking



Photo courtesy of Mandy Marconi

Types of Biologists





Research a Wildlife Biologist Job

Directions:

1. Go to the USA Jobs website: <https://www.usajobs.gov/>
2. Open up a blank Microsoft Word Document and write the following:
 - Your name and the date at the top of the page
 - The following headings as written on this screen:
 - Company/Agency Hiring:
 - Salary:
 - Work-Schedule:
 - Location:
 - Responsibilities:
 - Qualifications:
 - Is there a college education requirement?
 - Is having some related experience required?
3. Go back to the USA jobs website and search “Wildlife Biologist” in the Keywords search box. Leave the Location search box blank, and then click search.
4. A list of several wildlife biologist job posting should be showing on your screen at this time. Click on one of the wildlife biologist job postings that looks interesting to you.
5. Using the wildlife biologist job posting that you have chosen, fill in the headings on your word document with the information found in the job posting. Under the heading Responsibilities list one or two responsibilities in your own words, and under the heading Qualifications, answer yes or no to the two questions listed.



Biologist Job Application



Student Wildlife Biologist Application

Employment Application

Applicant Information			
Full Name:	<i>Smith</i>	<i>John</i>	<i>PA</i>
	<small>Last</small>	<small>First</small>	<small>State</small>
Address:	<i>Post Office Box 5038</i>		
	<small>Street Address</small>		<small>Apartment/Unit #</small>
	<i>Jersey Shore</i>	<i>PA</i>	<i>17740</i>
	<small>City</small>	<small>State</small>	<small>ZIP Code</small>
Phone:	<i>570-398-4744</i>		
Desired Annual Salary:	<i>\$48,000</i>		
Position Applied for:	<i>Coyote Biologist</i>		

Education

† List up to three subjects that you are currently studying or have studied. Explain how they help you in career as a biologist.

School Name :	<i>Ross Leffler School of Conservation</i>	Address:	<i>2001 Elmerton Avenue, Harrisburg, PA 17110</i>
Related Subjects	<i>Science</i>	How Does This Subject Help With Becoming A Biologist?	<i>This subject taught me about animal behavior and the scientific method which will help me study animals</i>
Related Subjects	<i>Math</i>	How Does This Subject Help With Becoming A Biologist?	<i>This subject taught me algebra and plot graphs which will help me look at relationships between two variables</i>
Related Subjects	<i>English</i>	How Does This Subject Help With Becoming A Biologist?	<i>This subject taught me clear and effective writing, which will help me write reports.</i>

Teacher Reference

Please list one professional reference.

Full Name: *Mrs. Mandy Marconi*

Previous Experience

List one or two experiences that you have working with animals or the outdoors.

Job Title:	<i>Pet Owner</i>
Responsibilities:	<i>Providing my dog with food, water, baths, exercise, playtime, and love.</i>
Job Title:	<i>Dog Shelter Volunteer</i>
Responsibilities:	<i>Cleaning animal cages and food and water dishes, walking dogs, feeding and watering animals</i>

Signature

Signature: *John Smith* Date: _____



State Game Warden



Become a Game Warden (0:038)

https://youtu.be/y-o8ub_4lbo

**Pennsylvania Game Wardens
Serving the Public Beyond the
Season (10:07)**

<https://www.youtube.com/watch?v=pcbCvIX8x0s>

State Game Warden Careers



Other Careers in the Pennsylvania Game Commission





Thank You! Questions?

Name:_____ Date_____

1. What weather conditions was the black bear biologist working in?
2. Was the terrain difficult to navigate? Why?
3. How did the bear biologist locate the bear den?
4. Why did he visit the den?

Name:_____ Date_____

1. What weather conditions was the black bear biologist working in?
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The Scientific Method for *Ruffed Grouse-Short Version* Film

Name: _____ Date _____

Observation:

Ask a Question:

Form a (testable) Hypothesis:

Make a Prediction:

Test the Prediction:

Conclusion:

Name: _____ Date _____

If 60 pounds of a black bear's diet is plants, acorns, and berries and 20 pounds of its diet is insects and other animals, what percentage of the whole diet is a vegetarian diet?

Answer _____

Name: _____ Date _____

If 60 pounds of a black bear's diet is plants, acorns, and berries and 20 pounds of its diet is insects and other animals, what percentage of the whole diet is a vegetarian diet?

Answer _____

Name: _____ Date _____

If 60 pounds of a black bear's diet is plants, acorns, and berries and 20 pounds of its diet is insects and other animals, what percentage of the whole diet is a vegetarian diet?

Answer _____



Mock Student Wildlife Biologist Application

Employment Application

Applicant Information

Full Name:				Date:	
	<i>Last</i>	<i>First</i>	<i>M.I.</i>		
Address:					
	<i>Street Address</i>			<i>Apartment/Unit #</i>	
	<i>City</i>		<i>State</i>	<i>ZIP Code</i>	
Phone:					
Desired Salary:	\$				
Position Applied for:					

Education

List one to three subjects that you are currently studying that may help you with becoming a biologist.

School Name :		Address:	
Related Subjects		How Does This Subject Help With Becoming A Biologist?	
Related Subjects		How Does This Subject Help With Becoming A Biologist?	
Related Subjects		How Does This Subject Help With Becoming A Biologist?	

Teacher Reference

Please list one professional reference.

Full Name:	
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Previous Experience

List one or two experiences that you have working with animals or the outdoors.

Job Title:	
Responsibilities:	
Job Title:	
Responsibilities:	

Signature

Signature:		Date:	
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Answer Sheet

Name: _____ Date _____

1. What weather conditions was the black bear biologist working in?

The black bear biologist was working in winter conditions.

2. Was the terrain difficult to navigate? Why?

Yes, the terrain was difficult to navigate because the den is in a remote area and there was deep snow to walk through.

3. How did the bear biologist locate the bear den?

The black bear biologist knows where the den is by a radio collar that the bear is wearing

4. Why did he visit the den?

The bear biologist is visiting the one-year old cubs (yearlings) to see how many survived since birth.

Answer Sheet

The Scientific Method for *Ruffed Grouse-Short Version Film*

Name: _____ Date _____

Observation: Ruffed grouse populations are at their lowest point in 50 years of monitoring

Ask a Question: Why did a tipping point occur in the ruffed grouse population decline after the early 2000s? Tipping point = declines without robust recovery

Form a (testable) Hypothesis: Infection of West Nile virus is contributing to the population decline of ruffed grouse

Make a Prediction: If ruffed grouse are exposed to the West Nile virus, Then they will be negatively impacted

Test the Prediction: Inoculate ruffed grouse chicks with West Nile virus and see if it negatively impacts them

Conclusion: 90% of ruffed grouse inoculated with West Nile virus died or had damage to critical organs from the virus, therefore, West Nile virus negatively affects ruffed grouse.

“Science rarely happens in one clean step – every hypothesis leads to new questions and new hypotheses as you try to figure out the big picture.” –Lisa Williams, PGC Grouse and Woodcock Biologist

Next Step: Test whether West Nile Virus is negatively affecting wild ruffed grouse populations (this step had its own hypotheses, predictions and tests of prediction.)

Conclusion: “Wild ruffed grouse in all regions of Pennsylvania are being infected with West Nile virus, as evidenced by positive antibodies in hunter-harvested birds...”-6 PGC Updates Newsletter 9/2017

Further readings:

<http://www.pgc.pa.gov/Wildlife/WildlifeSpecies/Documents/Grouse%20Newsletter%202017.pdf>



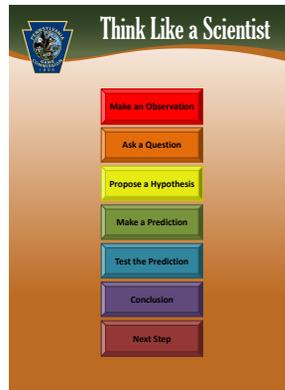
1. Today, we will talk about careers. What are some of things you may consider when you think about the career that you want? Some things that may be considered are career type, geographic location, job description, salary, benefits, work schedule, working conditions, interest, salary, required skills, employers... (Click)



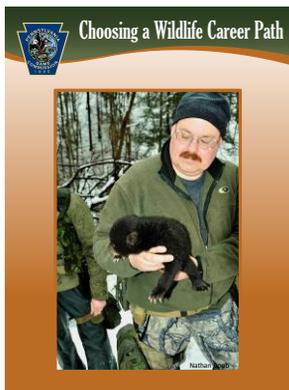
4. Let's watch a short video to see what happens when the biologist visits a bear den when the cubs are a year old. This type of den is referred to a yearling den. Note to teacher: pass out the accompanying worksheet (slide 19) and ask the students to complete the sheet while they watch the video. Review the correct answers (slide) after the video. Click the hyperlink on the screen to play the short video (2:20). (Click)



2. you ever consider a career working with wildlife? (Click)



4. Ask the students: "Have you ever observed something happening and wondered why it happened? Did you try to guess why? Did you ever test to see if you were right?" If so, whether you knew it or not, you were well on the path of thinking like a scientist.



3. Today, we will take a closer look at two careers in the Pennsylvania Game Commission that involves working with wildlife. The first career we will look at is a wildlife biologist. A biologist is a person who studies living organisms and their relationship to one another.-1

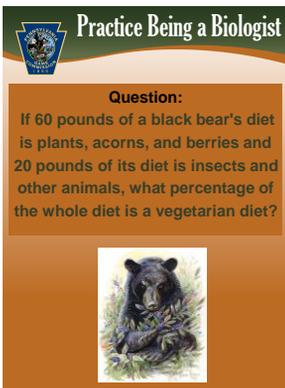
In Pennsylvania, a wildlife biologist usually works from a home office or from a regional office. Depending on their job, the biologist may spend a great deal of time in the field studying animals in their natural habitats and collecting data. Biologists may work in extreme weather conditions and navigate in difficult terrains to collect their data. Other times, biologists may spend more time in the office than in the field. (Click)

Biologist need a way to preform research in a way that is not influenced by bias or prejudice, so that it can be replicated over and over by anyone capable. That is why biologist and other scientist use the scientific method. The Scientific method is a means of gaining knowledge about the natural world by making observations, posing hypothesizes, and conducting experiments to test those hypotheses. -2. The scientific method helps the biologist study living organisms and their relationship to one another in a standardized way. The basic steps to the scientific method include:-4

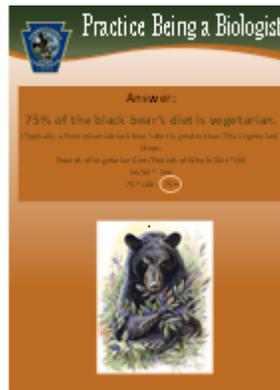
- Make an observation
- Ask a question about the observation
- You propose a hypothesis- a (testable) potential answer to the question
- You make a prediction-an outcome you'd expect to see if your hypothesis is correct. Use an If Then statement:
 - Test the prediction- by observation or an experiment
 - Conclusion-if your hypothesis is supported than it's likely it is correct, if it is not supported that it's likely that it's not correct
 - Next Step- reflect on the results of your test and use it as a guide to the next steps. If your conclusion is wrong form another hypothesis (Click)



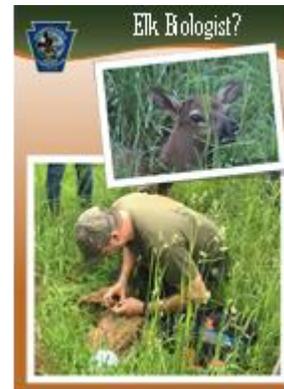
6. Now, let's look at a real-life wildlife problem that is happening in Pennsylvania. Ruffed grouse populations are declining. To learn what might be the cause, the ruffed grouse biologist used the scientific method to help figure out why the ruffed grouse population decreased dramatically. Note to Teacher: pass out the accompanying worksheet (slide 20). Have students complete it either during the movie or provide time after the movie to complete it. Review the correct answers following the movie. Click the hyperlink to play the video (9:10). (Click)



7. So far you have looked at working conditions of some biologist and how the scientific method is used to help solve real-life wildlife issues. Now, let's look at how math is used. Some biologist use more math than other biologists, but no matter what type of biologist you become, you will have to use some math. A biologist may use math to collect and display data, or to give the proper dosage of medicine, or to conduct population surveys. Let's practice being a biologist. Imagine that we need to know what percentage of a black bear's diet consists of vegetation. Teacher Note: Pass out the accompanying worksheet (slide 2). You have done some research and found that 60 pounds of a black bear's diet is plants, acorns, and berries and 20 pounds of its diet is insects and other animals. What percentage of the whole diet is a vegetarian diet?(Click)



8. Did you determine that 75% of the black bear's diet is vegetarian? Great work! (Click)



9. Now let's look at another type of biologist that works in Pennsylvania, an elk biologist. The elk biologist is primarily responsible for population analyses, research, and management of elk in Pennsylvania. The elk biologist monitors the health of the herd in many ways.

One way that the health of the herd is monitored is by capturing elk calves and collecting some data. The data collected and recorded includes: where the calf was found (helps the biologist determine important birthing grounds), the weight of the calf (this helps the biologist to see if they are born at a normal weight), the age of the calf, and whether it is male or female (typically, the birth of elk calves is split evenly between males and females). The biologist also looks over the calf's body condition to see if it appears to be healthy. Before releasing the calf, an ear tag is placed in each ear. The tag will provide future information if anything should happen to it. The biologist may place a tracking collar on a calf to gain more information on its survival. The elk biologist also collects information at the elk check station. The elk check station is the place successful licensed elk hunters must take their harvested elk to. At the check station, the biologist will collect information such as where the animal was harvested and biological samples. The biological samples are collected to test for Chronic Wasting Disease (CWD), Tuberculosis, and Brucellosis. A tooth is also pulled to determine the age of the animal. All the information collected helps the elk biologist manage elk and monitor the health of the elk herd. (Click)



10. Biologists often need to report their research to the public to help them gain an understanding of wildlife management or to gain support for wildlife management. Therefore, biologist need to know how to read, write, and communicate professionally. Their presentations should not have any grammar mistakes or misspelled words. Many biologists are excited to share new or important information with the public. (Click)



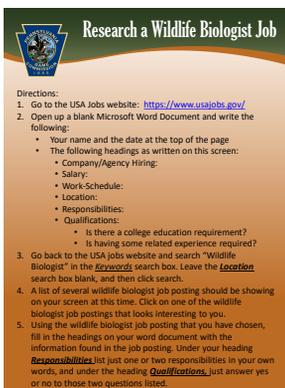
13. It's important to learn how to fill out an application for the job you are interested in. Note to teacher: Hand out the mock wildlife biologist job application worksheet to the students and have them fill it out (slide). Explain to the students that the application that was just handed to them is not how a real application looks, but it is similar. Some differences include: Under the "Education" section you would list your high school and college education instead of "related subjects". All applications are a little different, but usually contain the same types of information. (Click)



11. The Game Commission has many other types of wildlife biologist such as a deer biologist, farmland biologist, wild turkey biologist, waterfowl biologist, threatened and endangered species biologist, planning and grants administration biologist, habitat biologist, ornithologist (biologist that studies birds), and several more. As you see, there are several types of biologists. Some biologist study one animal and others study a group of animals (Click)



14. Let's look at one final career and perhaps one of the most recognizable wildlife careers in the Game Commission, a State Game Warden. "[State Game Wardens] are the Pennsylvania Game Commission's field officers and most visible employees.



12. Let's look at an actual job description for a wildlife biologist. Note to teacher: Have students work on a computer or an iPad to search for a wildlife biologist job description using the USA Jobs website: <https://www.usajobs.gov/>. They can follow the directions on this exercise. OR do this exercise together as a class to save time. The Pennsylvania Game Commission also posts biologist jobs and other jobs on their website when they are hiring. Go to pgc.pa.gov >>Click Information & Resources (top right)>>Click "Careers and Volunteers". (Click)

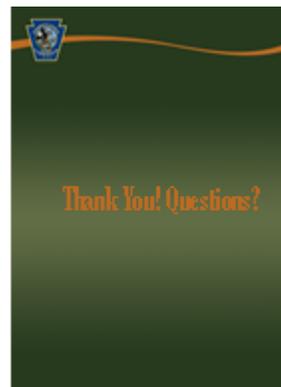
Applicants for these civil service positions must be in excellent physical condition, have knowledge of hunting and outdoor activities and be able to interact positively with people of all backgrounds. Employees in this classification are selected and appointed following a competitive examination conducted by the Pennsylvania Civil Service Commission. Officers begin their careers as Cadets assigned to the Ross Leffler School of Conservation, the Game Commission's training school located in Harrisburg, and are required to complete the training program there. Classes are normally formed every two or three years or as necessary to maintain the complement of officers in the field." -7. Play the short video (0:038) titled "Become a Game Warden". This video is a promotional video that shows snapshots into the career of a game warden, or Play a longer video (10:07) that shows some of the duties that a State Game Warden performs. (Click)



14. Let's look at one final career and perhaps one of the most recognizable wildlife careers in the Game Commission, a State Game Warden. "[State Game Wardens] are the Pennsylvania Game Commission's field officers and most visible employees. Applicants for these civil service positions must be in excellent physical condition, have knowledge of hunting and outdoor activities and be able to interact positively with people of all backgrounds. Employees in this classification are selected and appointed following a competitive examination conducted by the Pennsylvania Civil Service Commission. Officers begin their careers as Cadets assigned to the Ross Leffler School of Conservation, the Game Commission's training school located in Harrisburg, and are required to complete the training program there. Classes are normally formed every two or three years or as necessary to maintain the complement of officers in the field." -7. Play the short video (0:038) titled "Become a Game Warden". This video is a promotional video that shows snapshots into the career of a game warden, or Play a longer video (10:07) that shows some of the duties that a State Game Warden preforms. (Click)



15. Today we learned about two different types of wildlife careers in the Pennsylvania Game Commission- wildlife biologists and state game wardens. The Game Commission's mission is to manage all of Pennsylvania's wild birds, wild mammals, and their habitats for current and future generations. To implement their mission, the Game Commission employs several different individuals with different backgrounds and careers. Some other careers in the Game Commission, which work directly or indirectly with wildlife include: Information Technology Generalists and Administrators, Applications Developers and Administrators, Foresters, Licensed Professional Geologists, Wildlife Maintenance Propagator, Surveyor, Survey Technician. All these careers require taking a Civil Service Exam in addition to other requirements. However, there are other Non-Civil Service careers within the Game Commission such as members of the Habitat Maintenance Crews. (Click)



16. Questions?